What is claimed is:

1. A multi dynode device for electron multiplication and charged particle detection comprising:

a plurality of dynode plates arranged in a stacked configuration having an input end and an output end, each dynode plate in the stack having a plurality of apertures, wherein the apertures of one dynode plate are offset from the apertures of adjacent dynode plates; and

a power source connected to the plurality of dynode plates.

2. The device of Claim 1, wherein analyte ions or electrons enter the stack at the input end, impact a surface of one or more of the dynode plates to produce secondary electrons therefrom, and wherein some of the secondary electrons impact a surface of others of the plurality of dynode plates to produce multiple secondary electrons at the output end of the stack.

3. The device of Claim 1, wherein the plurality of apertures in each dynode plate are offset such that analyte ions or electrons entering the stack at the input end impact one or more dynode plates of the stack to produce multiple secondary electrons at the output end of the stack.

4. The device of Claim 3 wherein the apertures in each plate are offset by an amount equal to or greater than one half of an aperture opening in adjacent plates.

5. The device of Claim 1, wherein the power source provides bias voltage to the plurality of dynode plates, the power source comprising voltage supply and a bias network.

6. The device of Claim 5, wherein the bias network comprises a voltage divider having a plurality of taps, each tap of the plurality of taps being connected to a different one of the dynode plates in the multi dynode device.

7. The device of Claim 6, wherein the voltage divider is a capacitively loaded resistive voltage divider comprising a plurality of resistors connected in series; and a plurality of capacitors, each capacitor being connected in parallel to a different one of the plurality of resistors.

8. The apparatus of Claim 1, wherein the power source provides a voltage gradient to the plurality of dynode plates to cascade the electrons and the secondary electrons so formed from the input end to the output end of the stack.

9. The device of Claim 1, wherein the dynode plates of the plurality are spaced apart from one another in the stack.

10. The device of Claim 1, wherein the dynode plates are spaced apart from one another in the stack with an insulator material.

11. The device of Claim 7, wherein each dynode plate of the plurality of dynode plates is spaced apart from an adjacent dynode plate in the stack with a different one of the resistors of the plurality of resistors.

12. The device of Claim 11, wherein the resistors are thick film resistors printed and fired onto a side of each dynode plate.

13. The device of Claim 7, wherein each dynode plate of the plurality of dynode plates is spaced apart from an adjacent dynode plate in the stack with a different one of the capacitors of the plurality of capacitors.

14. The device of Claim 13, wherein the capacitors are thick film capacitors printed and fired onto one side of each dynode plate.

15. The device of Claim 1, wherein the dynode plates are made from a material selected from a conductive material, semi-conductive material, or a non-conductive material having a conductive coating deposited thereon.

16. The device of Claim 1, wherein each dynode plate further comprises an electron emissive coating on a surface facing the input end of the stack.

17. The device of Claim 1, wherein a portion of a surface of each dynode plate adjacent to each aperture has an inclination angle relative to a plane of the dynode plate.

18. The device of Claim 17, wherein the inclination angle of each dynode plate is aligned with the inclination angle of adjacent dynode plates.

19. The device of Claim 17, wherein the inclination angle of adjacent dynode plates in the stack alternate in opposite directions.

20. A hybrid detector apparatus for detecting analyte ions comprising:

an input portion comprising a microchannel plate;

an output portion comprising a multi dynode device, the multi dynode device comprising a plurality of dynode plates in a stacked relationship adjacent to the microchannel plate, wherein each dynode plate in the stack has a plurality of apertures, the apertures in each dynode plate being offset from the apertures in adjacent plates; and

a power source connected to the microchannel plate and to the multi dynode device for providing a voltage gradient on the plurality of plates.

21. The hybrid detector of Claim 20, wherein analyte ions that enter the microchannel plate produce electrons that enter the multi dynode device, and wherein the electrons cascade through the plurality of dynode plates with the voltage gradient, and wherein the apertures are offset in each dynode plate such that the electrons impact a surface of one or more of the dynode plates and produce multiple secondary electrons with each impact.

22. A mass spectrometer comprising an ion source for providing analyte ions, a drift region, an ion accelerator for accelerating the analyte ions into the drift region,

and an apparatus for electron multiplication and ion detection, the apparatus having an input end and an output end and comprising:

a multi dynode device comprising a plurality of dynode plates in a stacked relationship, each dynode plate of the plurality having a plurality of apertures, wherein the apertures of one dynode plate are offset from the apertures of adjacent dynode plates; and

a power source connected to the multi dynode device.

23. The mass spectrometer of Claim 22, wherein the apparatus further comprises a microchannel plate at the input end of the apparatus adjacent to the multi dynode device, and wherein the analyte ions enter the microchannel plate and produce electrons that enter the multi dynode device, and wherein the apertures in each dynode plate are offset such that the electrons impact one or more dynode plates to produce multiple secondary electrons with each impact.

24. The mass spectrometer of Claim 22, wherein the mass spectrometer is a time-of-flight mass spectrometer.